

**Systems**

**IBM 5973-L02 Remote  
Network Interface Adapter  
Specify Code 7043  
Product Description Manual**

The 5973-L02 Remote Network Interface Adapter (NIA) is a stand-alone unit that allows attaching a single SNA type 1 or 2 terminal/cluster to a Public Packet Switching Network (PPSN), using the X25 Packet Data Transmission Procedure.

The host must use either a 3705-2 with the X25NPSI, or a Communications Adapter plus a 5973-L02 Specify Code 7042 to interface the 5973-L02 via the PPSN.

The 5973-L02 Specify Code 7043 is connected to the Systems Network Architecture (SNA) through a single virtual circuit. This virtual circuit may either be permanent or switched.

**IBM**

## **Preface**

The 5973-L02 Remote Network Interface Adapter (NIA) Specify Code 7043 is a stand-alone unit that allows attaching a single SNA type 1 or 2 terminal/cluster to a Public Packet Switching Network (PPSN), using the X25 Packet Data Transmission Procedure.

### **First Edition (March 1982)**

This edition obsoletes and replaces GA11-8643-1. It is a complete revision and should be read in its entirety.

Changes are periodically made to the informations herein; before using this publication in connection with the operating of IBM systems, consult the latest *IBM System/370 and 4300 Processors Bibliography*, GC20-0001, for the editions that are applicable and current.

It is possible that this material may contain references to, or information about, IBM products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such products, programming, or services in your country.

Publications are not stocked at the address given below; requests for IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A form for reader's comments is provided at the back of this publication. If the form has been removed, comments may be addressed to:

Compagnie IBM France  
Centre d'Etudes et de Recherches  
Special Engineering  
Service 0959  
06610 La Gaude  
France

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

**CONTENTS**

<b>INTRODUCTION</b>	<b>1</b>
Typical Configuration in an SNA Environment	1
The Switched Network Backup Configuration	1
Generalities Concerning NIA Functions	2
Parameters to Define When Ordering the 5973-L02 SC 7043	2.1
Terminal/Cluster Configuration Information	4
<b>OPERATOR INFORMATION</b>	<b>5</b>
<b>OPERATING PROCEDURE</b>	<b>8</b>
Initial Machine Loading (IML)	8
Calling the Host (Switched Virtual Circuit only)	9
Using the SNBU Function	10
End of Session	10
Restarting a Session	11
<b>PROBLEM DETERMINATION</b>	<b>12</b>
Aids for Problem Determination	12
Problem Determination Aids	12
Problem Determination Aid 1	12
Problem Determination Aid 2	13
Problem Determination Aid 3	13
Problem Determination Aid 4	14
Initial Machine Loading Analysis (IML)	15
CE Routines (after IML)	16
Application Program (Normal Running)	16
Manual "CLEAR" (Switched Mode Only)	18
Manual "DISCONNECT"	18
At Keyboard Entry	18
<b>TECHNICAL DESCRIPTION</b>	<b>19</b>
Line Modem Interface	19
Frame Control Sequences	19
Network Interface	19
Line Description	20
Transmitted Data (BA/103)	20
Received Data (BB/104)	20
Request to Send (CA/105)	20
Clear to Send (CB/106)	20
Data Set Ready (CC/107)	20
Signal Ground (AB/102)	20
Receive Line Signal Detector (CF/109)	21
Transmitter Signal Element Timing (DB/114)	21
Receiver Signal Element Timing (DD/115)	21
Data Terminal Ready (CD/108.2)	21
Test (Not used for DATAPAC)	21
5973-L02 Line DTE Interface	21
Frame Control Sequences	22
DTE Interface	22
Line Description	22
Transmitted Data (BA/103)	22
Received Data (BB/104)	23
Request to Send (CA/105)	23
Clear to Send (CB/106)	23
Data Set Ready (CC/107)	23
Signal Ground (AB/102)	23
Receive Line Signal Detector (CF/109)	23
Transmitter Signal Element Timing (DB/114)	23
Receiver Signal Element Timing (DD/115)	23
Wrap (CX)	23
Data Terminal Ready (CD/108.2)	24
5973-L02 Physical Planning	24
<b>5973-L02 LOGICAL LINK CONTROL DESCRIPTION</b>	<b>26</b>
The LLC Procedure	26
PSH Format	27
Segmenting a PIU	27
Segmenting Example (With TH Format FID1)	27

Desegmenting Packets to Recombine a PIU . . . . .	28
Example of Desegmenting . . . . .	28
How the SDLC is Controlled by the LLC . . . . .	29
SDLC Report to the PLP . . . . .	29

INTRODUCTION

The 5973-L02 Network Interface Adapter (NIA) is a standalone unit that allows attaching a single SNA type 1 or 2 terminal/cluster to a Public Packet Switching Network (PPSN), using the X25 Packet Data Transmission Procedure.

TYPICAL CONFIGURATION IN AN SNA ENVIRONMENT

The 5973-L02 Specidy Code (SC) 7043 is connected to the Standard Network Architecture (SNA) host through a single Virtual Circuit (VC). This VC may be a Permanent Virtual Circuit or a Switched Virtual Circuit.

The host must use either a 3705-2 with the X25NPSI Product Program, or a Communications Adapter plus a 5973-L02 SC 7042 to interface the 5973-L02 via the PPSN.

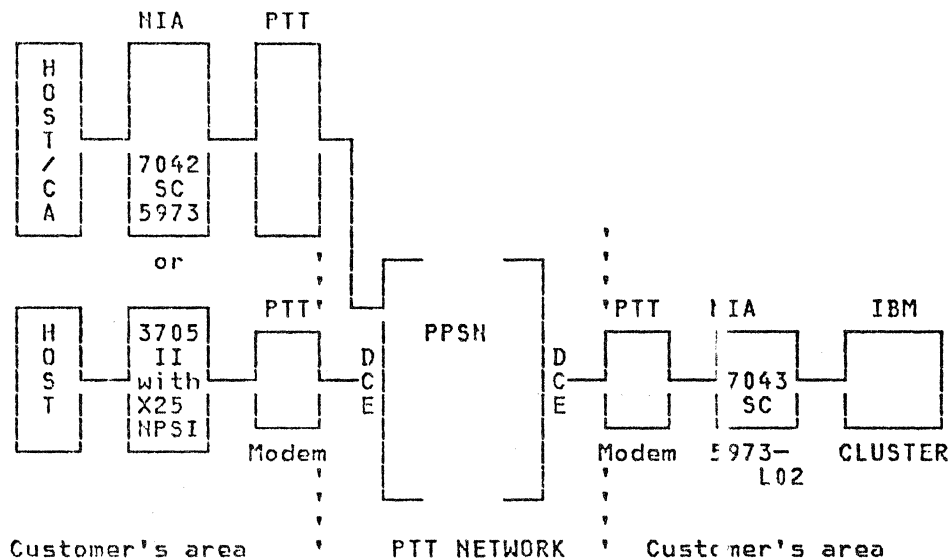


Figure 1. Typical Configuration in an SNA Environment

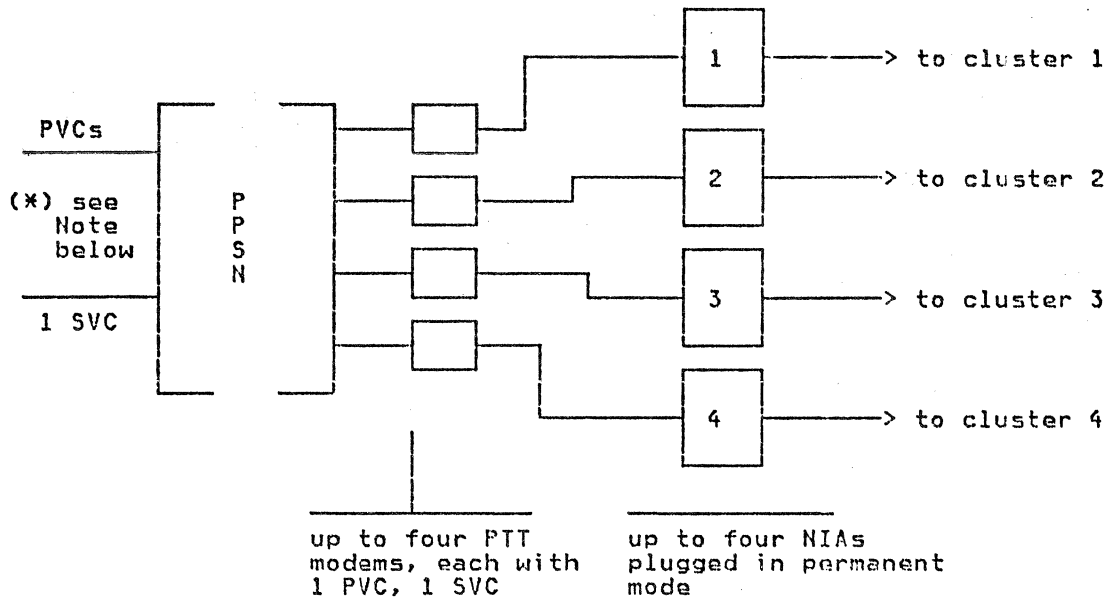
THE SWITCHED NETWORK BACKUP CONFIGURATION

This function (SNBU) is available on the remote cassette, Part Number 8684649 (this number is written on the cassette itself). When the remote NIA is in permanent mode, the SNBU function allows the operator to use the remote NIA as in switched mode. This function is available under the following conditions:

- The number written on the cassette is PN 8684649
- The corresponding subscription with the PTT is performed:
  - For PPSN allowing lower VC number 0 (for example TRANSPAC):  
PVC = 0; SVC = 1
  - For PPSN allowing lower VC number 1 (for example DATEX-P):  
PVC = 1; SVC = 2

- The host side has the possibility to work in switched mode: IBM 3705 with X25 NPSI program product or supplementary frontal plugged in switched mode with a frontal PN 8684648 cassette (this number is written on the cassette itself)

Note that the SNBU function is particularly interesting when a permanent virtual circuit on the network failed (whatever is the cluster SDLC address).



Note: For the host side, refer to the NCP Packet Switching Program Product and Operation Manual, Program Product 5668-981, SC30-3(78, or to the IBM 5973 L02 SC 7042 Product Description Manual, GA11-8642.

#### GENERALITIES CONCERNING NIA FUNCTIONS

The 5973-L02 SC 7043 is loaded automatically at power ON via an integrated microcassette reader. The Initial Machine Loading (IML) takes approximately 90 seconds. Two microcassettes are provided (one spare microcassette, and an operating one). These microcassettes are written on one side only, as indicated by the labelling.

The 5973-L02 allows changing from the SDLC procedure to the X25 procedure to permit data packet exchange via the PPSN.

For the terminal cluster it is attached to, the NIA plays the part of the SDLC transmission modem and controls the data exchange according to SDLC rules.

For the PTT modem interfacing the PPSN, the NIA plays the part of a terminal/cluster able to control data transmission over the line according to X25 rules. The user's data is transmitted over the PPSN in the form of discrete blocks of data called packets. These packets have a length that may be chosen at subscription time. They include headers that allow controlling their transmission via the PPSN.

The 5973-L02 may segment the terminal/cluster messages into data packets of the right length to go through the PPSN. This is the SEGMENTING function.

The 5973-L02 may also recombine several data packets received from the PPSN into a regular message for the terminal/cluster. This is the RECOMBINING function.

Note 1: The insertion of the NIA in a chain implies an additional delay of transmission. This additional delay is equal to the transmission time between the interfaces of the NIA and of the cluster.

Note 2: When an error occurs at PLP level, certain X25 networks do not ensure recovery. Generally, the virtual circuit on which the error has been detected is reset (permanent mode), or cleared (switched mode). The data present in the network at the moment the error was detected may be lost.

For this reason, the 5973-L02 does not either ensure recovery in case an error should occur at PLP level: The cause/diagnostic of CLEAR or RESET are recorded, and the buffers are automatically re-initialized. Therefore, the data present at the time the error occurs is lost.

It is the user's responsibility to ensure data integrity by using the facilities offered by the IBM architecture (SNA), or by performing the complete data exchange again.

#### PARAMETERS TO DEFINE WHEN ORDERING THE 5973-L02 SC 7043

A set of parameters must be defined to adjust the 5973-L02 to your chosen configuration.

Please record the chosen values for future checking.

Note: The virtual circuit value or lower virtual circuit address is set at subscription time to '00' or to '01', and is selected by the Specify Code at ordering time and by strapping at the time of manufacturing and/or installation.

1. PPSN Line speeds between the PTT modem and the 5973-L02 (defined with the PTIs at subscription time).

MODEM
1200 BPS
2400 BPS
4800 BPS
9600 BPS

2. Line speeds or terminal signalling rate between the 5973-L02 and the terminal/cluster selected by the Specify Code at ordering time and by strapping at the time of manufacturing and/or installation:

1947





**Note 1:** The insertion of the NIA in a chain implies an additional delay of transmission. This additional delay is equal to the transmission time between the interfaces of the NIA and of the cluster.

**Note 2:** When an error occurs at PLP level, certain X25 networks do not ensure recovery. Generally, the virtual circuit on which the error has been detected is reset (permanent mode), or cleared (switched mode). The data present in the network at the moment the error was detected may be lost.

For this reason, the 5973-L02 does not either ensure recovery in case an error should occur at PLP level: The cause/diagnostic of CLEAR or RESET are recorded, and the buffers are automatically re-initialized. Therefore, the data present at the time the error occurs is lost.

It is the user's responsibility to ensure data integrity by using the facilities offered by the IBM architecture (SNA), or by performing the complete data exchange again.

**PARAMETERS TO DEFINE WHEN ORDERING THE 5973-L02 SC 7043**

A set of parameters must be defined to adjust the 5973-L02 to your chosen configuration.

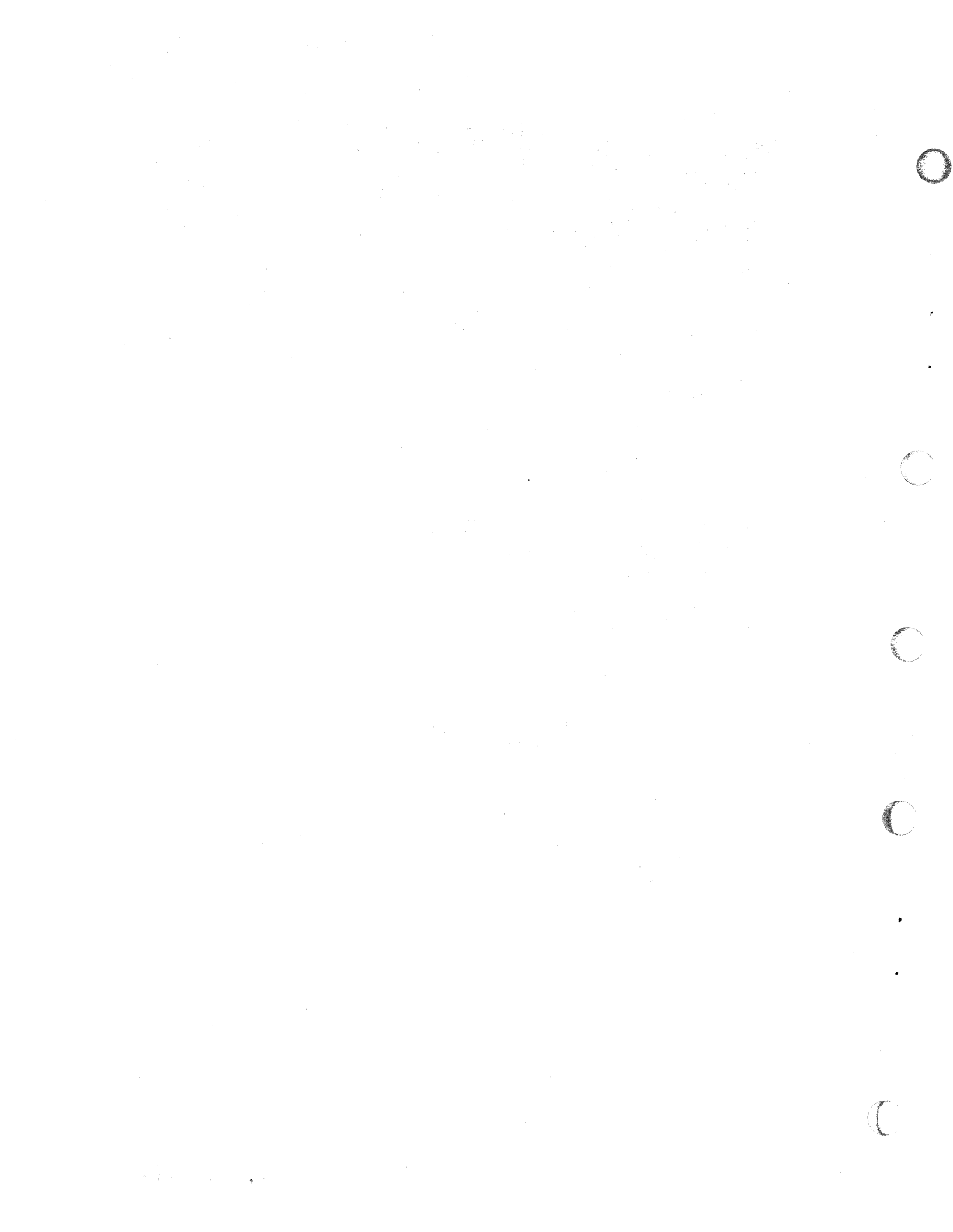
Please record the chosen values for future checking.

**Note:** The virtual circuit value or lower virtual circuit address is set at subscription time to '00' or to '01', and is selected by the Specify Code at ordering time and by strapping at the time of manufacturing and/or installation.

1. PPSN Line speeds between the PTT modem and the 5973-L02 (defined with the PTTs at subscription time). There is no Specify Code or strapping of the 5973-L02 for PPSN line speeds.

MODEM
1200 BPS
2400 BPS
4800 BPS
9600 BPS

2. Line speeds or terminal signalling rate between the 5973-L02 and the terminal/cluster selected by the Specify Code at ordering time and by strapping at the time of manufacturing and/or installation:



DTE
1200 BPS
2400 BPS
4800 BPS
9600 BPS

3. The PPSN line access procedure, defined according to the characteristics of the network used at subscription time. Selected by the Specify Code at ordering time and by strapping at the time of manufacturing and/or installation.

LAP
LAP-B

4. PPSN Circuit type (permanent or switched) through the network. It is defined with the PTTs at subscription time. Selected by the Specify Code at ordering time and by strapping at the time of manufacturing and/or installation.

Permanent
Switched

5. The PPSN packet length is defined with the PTTs at subscription time, and is selected by the Specify Code at ordering time and by strapping at the time of manufacturing and/or installation:

256 bytes
128 bytes

6. The PPSN timeout delay at LAP level. It is selected by strapping at the time of manufacturing or installation, according the chosen PPSN line speed.

0.5 sec for 9600 bps
1.0 sec for 4800 bps
2.0 sec for 1200/ 2400 bps

7. The window value is the maximum number of frames (or packets) that can be anticipated, that is, sent or received without acknowledgement at or from a given point.

WN	Number of frames (PPSN LAP level)	7
WP	PPSN Packet Window Size (2 to 7)	
WC	DTE SDLC Window Size (3 or 7)	

**Note:** The WC value is from NIA to cluster and depends on the Maxout value expected by the cluster. From cluster to NIA, a WC value of a maximum of 7 is expected.

The PPSN WN and WP values must be in concordance in both the network and the NIA (to those chosen at subscription time).

- The retry value is the number of times a frame is retransmitted when it has not been acknowledged within the appropriate time limits (timeout recovery).

N2N	X25 Retry (fixed)	10
N2C	SDLC Retry (fixed)	5

- Delay switching between Receive/Transmit on the SDLC side: Frame transmission from the NIA to the cluster can be delayed by 100 ms. This is selected at ordering time by the Specify Code, and by strapping at manufacturing or installation time.

NODEL	NORMAL
DEL	DELAY SWITCHING 100 ms

**TERMINAL/CLUSTER CONFIGURATION INFORMATION**

- SDLC half duplex mode, 2-wire, controlled request to send.
- CCITT V24 circuit 108.2, data terminal ready.
- External modem clocking, with WRAP option (leased or switched). The leased option is recommended when using permanent virtual circuits. The switched option is recommended when using switched virtual circuits. You should choose the leased option as a default value but, in this case, the terminal/cluster will not be informed of a communication being cleared.
- The maximum PIU length must be limited to 256 bytes of RU.
- NRZ (not NRZI).
- The SDLC station address must be adjusted to the entire configuration. It can take any value if the configuration does not use 5973-L02 SC7042 (frontal NIA). If a frontal NIA is used, adjust the SDLC station address at the remote location in accordance with the value defined in the host. Refer to the "Host Generation Information" section of the 5973-L02 SC7042 Product Description Manual, GA11-8642.

This section describes the operator panel and the back panel as used in normal operations with the PPSN.

As an operator, you will use connectors, switches, the keyboard, and indicators and displays located on the front and rear of the 5973-L02.

- The front is called the OPERATOR panel
- The rear is called the BACK panel.

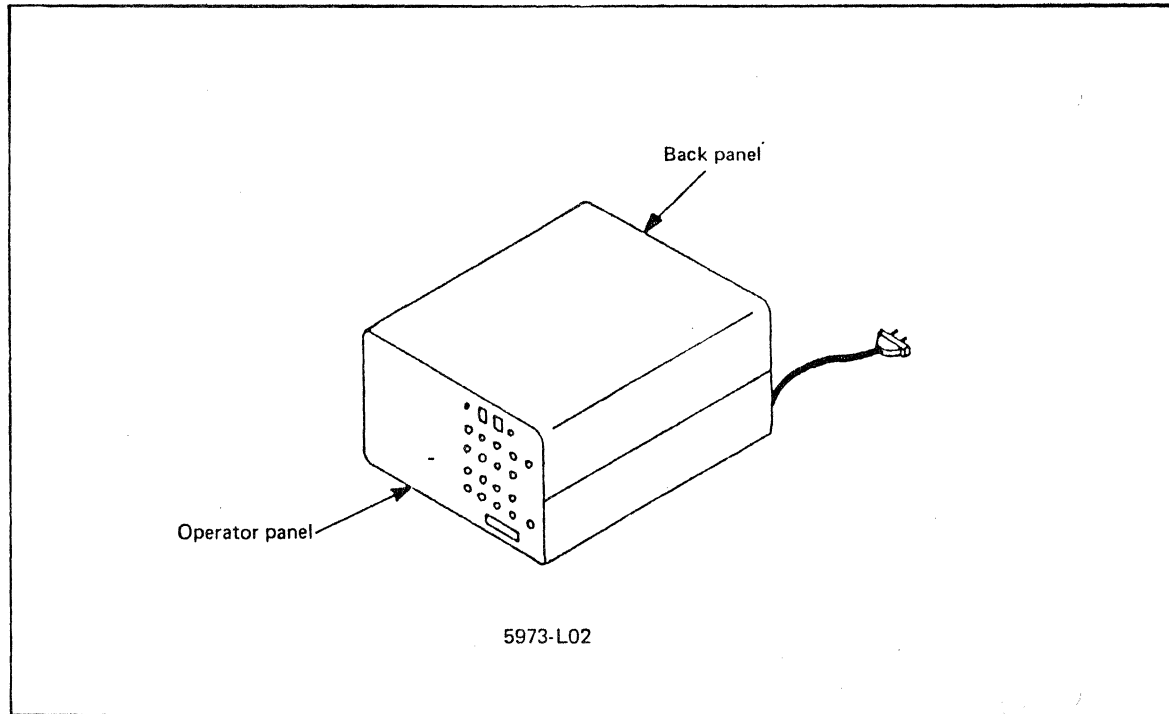
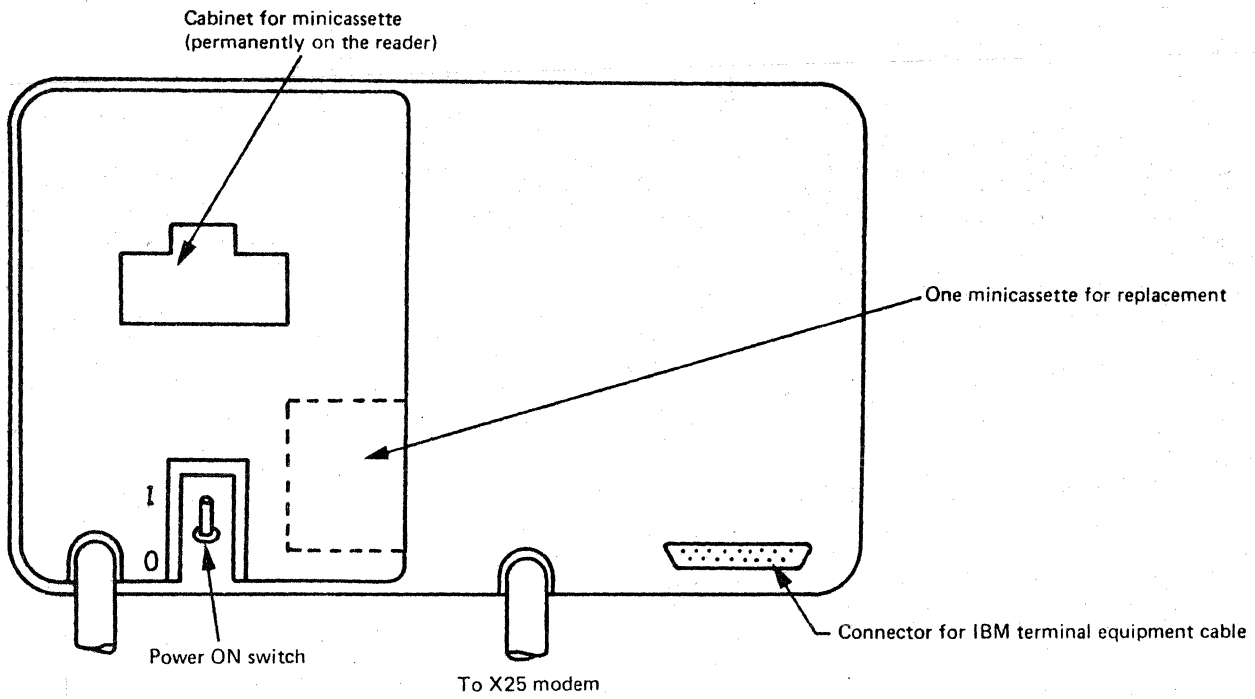


Figure 2. The IBM 5973-L02 Network Interface Adapter

Use a cloth dampened with a mild soap solution to clean the covers, the keyboard, the indicators and the display face. The soundhead of the microcassette reader must be cleaned for correct operation.

**CAUTION:** Do not use spray cleaners on the operator panel or on the rear plastic cover.

Back Panel



Operator Panel

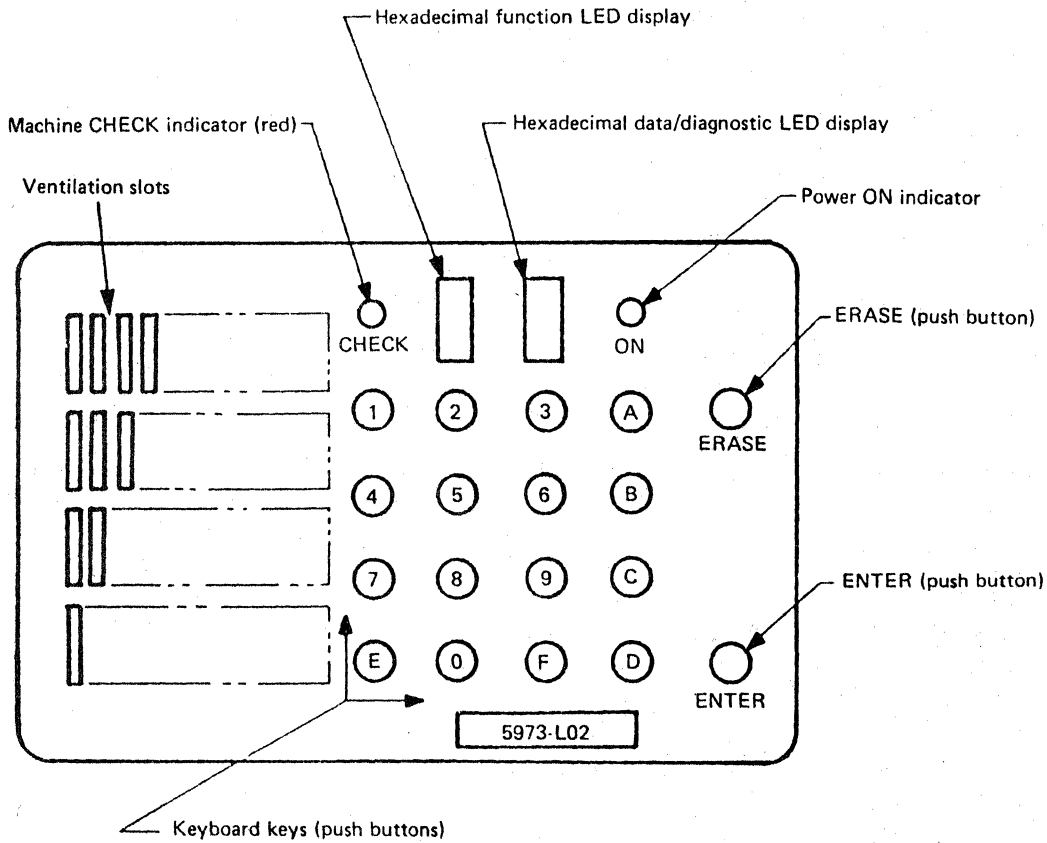


Figure 3. Details of the Operator Panel and of the Back Panel

- The CHECK Indicator

This red lamp is OFF in normal conditions. If lit, it indicates, either that a memory parity error was found, or that the program is not running correctly.

- The POWER ON Indicator

It indicates that power is applied to the 5973-L02.

- The HEXADECIMAL Function LED Display

This red LED is used to display the alphanumeric code of the function entered from the keyboard, or to display the present status of the program during operations.

Note: Certain error conditions may cause these indications to flash.

- The HEXADECIMAL Data/Diagnostic LED Display

This LED is used to display the data, if any, entered from the keyboard. As there is only one LED to display several data characters, the last character entered, if any, is displayed first, followed by a blank (LED off). Then, all the characters entered are displayed one after the other, each one followed by a blank, and so on, until a new key is pressed.

If the number of characters entered is greater than 30, only the last 16 characters entered are displayed.

This LED is also used by the program to display a coded diagnostic character if an error occurs in the 5973-L02 X25/SDLC link control code operation.

- The Keyboard Keys

There are 16 pushbuttons numbered from 0 to F. They are used to send functions or transmit data to the control code.

The same key may be used as a function key or a data key.

If used for data, an authorized function must have been sent before, or the data will be considered by the control code as a function or an error.

The keyboard keys are used in combination with the ENTER and ERASE keys.

- The ERASE Key

It is used to cancel a wrong function entered from the keyboard. In such a case, the function LED displays the last function requested by the control code before the wrong command was entered.

It is also used to cancel data entered from the keyboard without having to re-enter the associated function. It is necessary to re-enter the right data.

- The ENTER Key

It is used to validate any function entered from the keyboard. It also indicates to the control code the end of the entered data.

## OPERATING PROCEDURE

This chapter describes the normal procedure to follow to operate the 5973-L02.

If the 5973-L02 does not react as described herein, refer to the "Problem Determination" section of this manual.

### INITIAL MACHINE LOADING (IML)

1. Check that the physical connections are made between:
  - The 5973-L02 and the terminal/cluster
  - The 5973-L02 and the PTT modem
  - The 5973-L02 and the mains.
2. Apply power ON:
  - The terminal/cluster
  - The PTT modem (check normal position).
3. Introduce one of the two control code tape microcassettes into the cassette reader if necessary (check the position of the label on the external side to ensure proper introduction of the cassette).
4. Apply power to the 5973-L02 to load the control code automatically (the power ON indicator lights up on the operator panel).

The left LED indicator displays either no indication if the microcassette reader is rewinding the tape, or a flashing '0' during cassette reading (approximately 90 seconds).

Note for information only: Once the cassette has been read, the control code performs the following steps automatically:

- a. CE routines running to check the 5973-L02 hardware interfaces: The left LED displays a succession of numbers (from 1 to 7). You can usually see 3, 5, or 6.
- b. Initialization of all the 5973-L02 registers.
- c. Automatic disconnection, then automatic link setup at LAP level with the first node of the PPSN.

The left LED displays 'D' during the disconnection phase, then 'A' until the automatic link setup is established. Then, the left LED displays 'B' if in switched mode, or 'E' if in permanent mode.

Note 1: With some clusters or terminals, at the end of loading, the left LED displays a flashing A, the right LED displays 1 and the link setup cannot be performed. If so, enable your cluster/terminal. When it is enabled, the 5973-L02 automatically performs the link setup function and you may continue as follows.

Note 2: If in switched mode, and when the 5973-L02 displays 'B' (steady or flashing) on its left LED, it is able to receive an incoming call from the PPSN without any intervention from the operator. If this call is accepted, the NIA displays 'E' on its left LED. In this case, skip to "Note for Information Only" below.

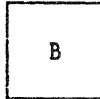


CALLING THE HOST (SWITCHED VIRTUAL CIRCUIT ONLY)

If the 5973-L02 is in permanent mode, skip to "Note for Information Only" below.

1. Check that the 5973-L02 asks for a call entry:

left LED



right LED



2. Press the "B" and "ENTER" keys.

The LED display does not change.

Note: If a wrong value has been entered, B flashes on the left LED and F appears on the right LED. Retry 'B' and 'Enter'.

3. Successively press the keys to compose the called host's number. You can check the entered number on the right LED - cyclic display.
4. Press "F" (used as a separator, F is not displayed on the right LED and stops the preceding display).
5. Successively press the keys to compose your calling number, if any. You can check on the right LED.
6. Press "F" (as in 4).
7. Successively press the keys to compose the chosen facilities if any, according to the table below:

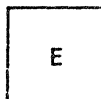
Reverse charging	0 1 0 1	
Closed user group	0 3 x x	(see note)
Priority service (DATAPAC only)	0 1 0 2	

Note: xx is the specific closed user group parameter.

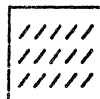
8. Press 'F' (as in 4).
9. Successively press the keys to compose user data if any.
10. Press the 'ENTER' key to send the call request to the PPSN.

When the call request has been accepted, the 5973-L02 displays:

left LED



right LED



IMPORTANT NOTE: Steps 1, 3, 4, 6, 8, and 10 are mandatory, even though steps 5, 7, and 9 are not performed.

Note for information only: When the left LED displays "E", the 5973-L02 is able to receive messages from the connected host.

As soon as the CONTACT command has been answered by the CONTACT response, the 5973-L02 is in normal running mode for data exchange and displays:



When the connected host stops the data exchange, it sends a DISC command. As soon as the 5973-L02 has answered it by a DISC response, it returns to the "E" status and displays:



Note: CONTACT and DISC are command/responses used in the IBM data link protocol.

#### USING THE SNBU FUNCTION

The configuration must be as described in the SNBU environment paragraph. This function may be performed at any time under the condition the NIA displaying E (flashing or not) on its left LED. Then press B and ENTER keys: The NIA is now displaying B on its left LED. Now, the remote NIA is in SNBU mode and is allowed to work as in switched mode. To perform a call, skip to the paragraph "Calling the Host (Switched Virtual Circuit only)".

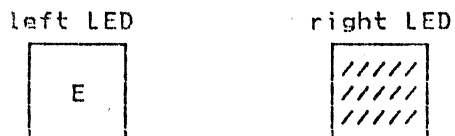
Returning from SNBU mode to permanent mode can be performed at any time under the condition that the remote NIA is displaying A or B (flashing or not) on its left LED. Then, press the A and ENTER keys: The NIA performs an automatic link setup, returns to the permanent mode and displays E on its left LED.

If the NIA doesn't succeed in performing the link setup, it will display A on the left LED and a diagnostic on the right LED. See the "Application Program (Normal running)" paragraph.

Note that, when in SNBU mode, a "power off" action causes the NIA to return to the permanent mode.

#### END OF SESSION

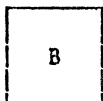
1. Check that the 5973-L02 asks for end-of-session (or new session).



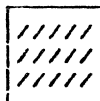
2. Press the "C" and "ENTER" keys (in switched mode only).

When the clear request has been accepted, the 5973-L02 displays:

left LED



right LED

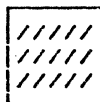


3. Press the "D" and "ENTER" keys. When the disconnect has been accepted by the PPSN, the 5973-L02 displays:

left LED



right LED



4. Put the 5973-L02 power OFF (see note)
5. Take the usual actions concerning the terminal/cluster and the PTT modem.

Note: Step 4 may be replaced by a new session with a host. In this case, instead of putting the 5973-L02 power OFF, execute a manual link setup as explained in the following paragraph.

RESTARTING A SESSION

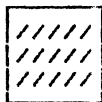
Press the "A" and "ENTER" keys. When the link has been established at the LAP level, the 5973-L02 displays:

either

left LED



right LED



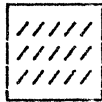
if in  
switched  
mode

or

left LED



right LED



if in  
permanent  
mode

Then continue as in the above paragraph.

**PROBLEM DETERMINATION**

This section describes the indicators and LED displays of the 5973-L02 in case of abnormal running.

The symbols used have the following meaning:

- /// The LED is off
- x The alphanumeric data is steadily displayed by the LED
- 'x' The LED flashes the alphanumeric data

This section is a guide for the operator to:

- Identify minor problems that can be quickly resolved
- Determine which maintenance service should be called to locate and correct the problems encountered.

**AIDS FOR PROBLEM DETERMINATION**

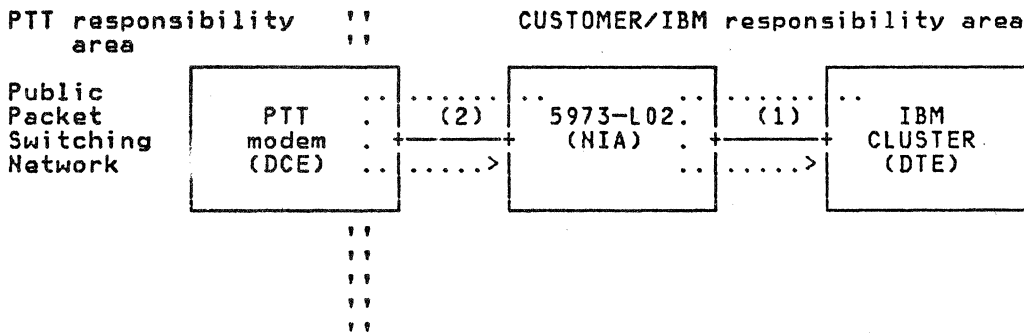


Figure 4. Simplified Configuration and NIA Tests

Two tests are available with the 5973-L02 (see Figure 4 above).

**PROBLEM DETERMINATION AIDS**

**PROBLEM DETERMINATION AID 1**

This concerns wrapping the cluster/terminal through the 5973-L02 (only if supported by the cluster/terminal used).

- Load the 5973-L02 (Power ON)
- Set the PTT modem OFF
- Enable the cluster/terminal by initializing the WRAP/DIAGNOSTIC at the cluster/terminal and,
- Check the result of the test at the cluster/terminal.

**Note:** If unsuccessful, call the IBM CE.

### PROBLEM DETERMINATION AID 2

This is an online wrap between the PTT modem and the NIA.

- Put the PTT modem into the LOCAL LOOP position, if it is available. (For instance, loop 3 with TRANSPAC modems.)
- Key 9 + ENTER.
- Check the LED displays.

'A'	1
-----	---

A	///
---	-----

The line is OK. The problem is under PTT responsibility: Call the PTT.

'9'	1
-----	---

9	///
---	-----

The line is in error. See (19) in problem determination.

'9'	0
-----	---

**Note:** In the case of a wrong manipulation (local loop position omitted for instance), re-initialize the 5973-L02 by performing POWER OFF, POWER ON.

### PROBLEM DETERMINATION AID 3

This concerns the analysis of the causes/diagnostics delivered by the PTT network, or the diagnostics delivered by the NI/s.

1. Cause/diagnostic delivered by the network or the front side:

When the network or the front side has sent a RESTART, CLEAR, or RESET indication, the 5973-L02 answers with a confirmation and displays:

'B'	E
-----	---

or

'E'	E
-----	---

in switched mode

in permanent mode

If you want to know the CAUSE/DIAGNOSTIC sent by the network, press "ENTER". The LED displays:

x	x
---	---

y	y
---	---

z	z
---	---

cyclically, where xx is the coding of the RESTART, CLEAR, or RESET command, yy the CAUSE, and zz the DIAGNOSTIC. Entering a new function cancels this display.

xx=

FB RESTART  
13 CLEAR  
1B RESET

yy, zz: Refer to the tables provided by the public network used. (For some networks, zz is not significant.) When yy=00 the diagnostic is delivered by the host. (In this case, some networks replace the diagnostics by 00.)

In this case, refer to the NCP Packet Switching Interface Program Description and Operation Manual Program Number 566: -981, SC30-3078, or to IBM 5973-L02 Specify Code 7042 Product Description Manual, GA11-8642.

2. Diagnostic delivered by the remote NIA itself:

When the CLEAR or RESET is generated by the 5973-L02, it displays:

'B'	Z
-----	---

or

'E'	Z
-----	---

In switched mode

In permanent mode

Where Z has the same value as in (15) of the "Problem Determination" section of this manual (Z different from E or F).

Note:

When a CLEAR, RESET, or RESTART is followed by others, the only one to be displayed will be the last one.

PROBLEM DETERMINATION AID 4

This concerns the use of the SDLC Link Test Function ("F3" SDLC COMMAND/RESPONSE).

When this function is available in your host, you can use it with the NIAs. Nevertheless, this test must be performed with a station in Normal Disconnected Mode (NDM) only. In the case of a leased multipoint SDLC line, and when the host allows it, this test can be run on one of the stations (this one being in NDM as above) without affecting the other stations which can continue working in Normal Response Mode (NRM). To get information on this function, consult your IBM Customer Engineer.

When the test response does not contain any data, it may mean that:

- The test was sent when the station was in normal connected mode (not accepted by the NIA).
- The test was sent with too much data for the virtual circuit (not accepted by the NIA).
- The test was sent with too much data for the terminal/cluster (not accepted by the terminal/cluster).

INITIAL MACHINE LOADING ANALYSIS (IML)

(PROBLEM)

RECOVERY

Power ON  
- - -

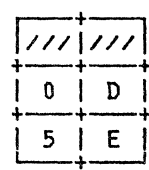
(1) — Power ON indicator does not light

- Check that the power plug is plugged into the wall outlet.

(2) — Check indicator is ON (lit)

- Reset the power switch to OFF and wait 60 seconds. Retry power ON 3 times. If unsuccessful, go to 20.

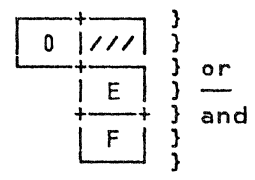
(3) — LED displays



- Wait for 2 minutes and turn the power OFF.
- Check if a cassette is correctly mounted in the reader (check that the label is on the visible side) and apply the power ON.
- Power OFF and try the second cassette if the reader seems to be OK. Power ON (if OK with this cassette, contact the IBM CE for a new spare cassette).
- If in 5E, check that the clock is received from the PTT modem. Power OFF/ON to retry.

If unsuccessful, go to 20.

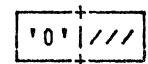
(4) — LED displays



- Check as in 3 above
- Check that the cassette has been written on (correct side)
- (Power OFF/ON) with the second cassette.

If unsuccessful, go to 20.

(5) — LED displays



- Power OFF/ON with the second cassette.
- Check that the soundhead of the cassette reader is clean.

If unsuccessful, go to 20.

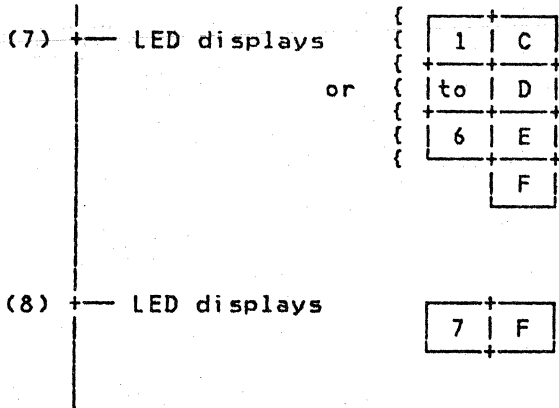
and no IML after 3 mn

(6) — Any other abnormal display not described here:

- Retry with the second cassette.

If unsuccessful, go to 20.

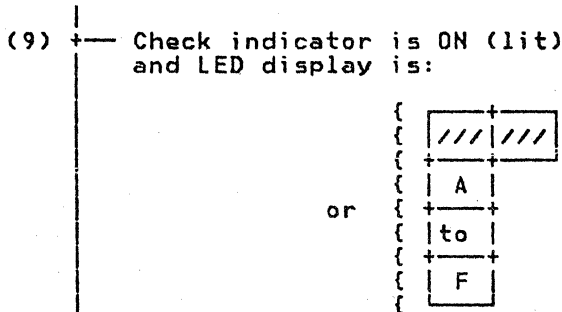
CE ROUTINES (AFTER IML)



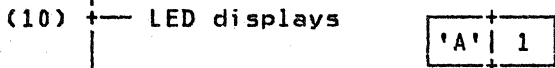
- Retry from IML
- If 5F or 5E check the PPT modem connection and retry.
- If there is modem trouble, call the PTT. If the modem is OK, go to 20.

- Check the connections at the back of the 5973-L02.
- If unsuccessful, go to 20.

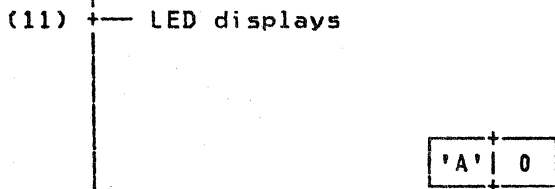
APPLICATION PROGRAM (NORMAL RUNNING)



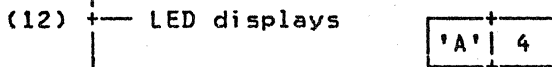
- Retry from IML (Power OFF/ON).
- If unsuccessful, go to 20.



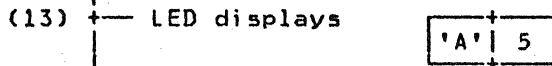
- Check that the terminal/cluster is power ON and enabled. (See DTR line description in the 5973-L02 Line DTE interface section of this manual).
  - Check cable connections.
- If unsuccessful, go to 20.



- Check that the PTT modem is power ON, DSR ON (107). Check that the PTT modem has its switch in the "Normal" position for transmission (see the PTT modem documentation).
- Check cable connections.
- Use WRAP test "9" (PD AIDS 2).
  - if the WRAP test is OK, call the PTT for line checking.
  - If not, go to 20.



- Use WRAP test "9" as in 19. The answer to SARM or SABM is not received.



- Call the PTT. The SARM is not received in double exchange.



(14) LED displays

'D' | 4

'D' | 5

- The answer to X25 DISC is not received. Check the PTT modem and call the PTT.
- Key A + ENTER to restart the complete data exchange from the connection to the network (normal running).

(15) LED displays

'B'	F
'E'	F

You have keyed a wrong function. To correct this, key the correct function requested by the left LED.

'B'	X
'E'	X

In switched mode,

In permanent mode,

If X=E, clear restart or reset received from the PPSN or the front side (cause 00); press ENTER to display the cause diagnostic (see Problem Determination Aid 3.)

If X=other value, clear or reset sent by the NIA remote. The meaning of the other values of X are shown below.

2
3
4
7
8
9
A
B
C

Indicates that the DTR is turned off or was turned off (microcut, for instance). If the cluster/terminal DTR is always OFF, enable it. When the DTR goes ON, the diagnostic will stay until the contact between the host and the cluster is made. (See DTR Line Description in the 5973-L02 Line DTE Interface section of this manual.)

Loop or memory parity error. Disconnect and retry the link setup. Note the incident to inform the IBM CE at the earliest opportunity.

Check cluster cable connection and verify if the cluster is power ON. If unsuccessful go to (20).

SDLC timeout not recovered from or SDLC procedure error PLP header invalid. Unknown format.

Local PLP procedure error. Received P(R) or P(S) invalid.

Local PLP procedure error: Received message does not correspond to the status of the PLP.

Sequence lost in information exchange PLP.

LLC mode not OK in PLP call. LLC sequence lost.

When using the remote cassette, part number 8684649 (this number is written on the cassette itself), the following displays are available:

B	6
E	6
F	6

frame received with wrong VC number

- VC number 0 in SNBU mode on PPSN allowing lower VC number 0.
- VC number 1 in SNBU mode on PPSN allowing lower VC number 1.
- VC number 1 in permanent mode on PPSN allowing lower VC number 0.
- VC number 2 in permanent mode on PPSN allowing lower VC number 1.

The NIA will send a CLEAR or a RESET on this wrong VC number and will display B6, E6, F6, according to whether the previous display was B, E, or F.

Note: the data exchange is cancelled and must be started again, except when the NIA displays F6.

MANUAL "CLEAR" (SWITCHED MODE ONLY)

C +  
Enter  
(16)

LED displays

More than 1 mn

C	///
---	-----

- Retry C + ENTER 3 times.

If unsuccessful, disconnect and retry link setup if necessary.

MANUAL "DISCONNECT"

D +  
Enter  
(17)

LED displays

more than 30 seconds

D	///
---	-----

- Retry D + Enter 5 times.

If unsuccessful, Key A + ENTER.  
If still unsuccessful, go to 20.

AT KEYBOARD ENTRY

from  
A to F  
+Enter  
(18)

LED displays

'X'	F
-----	---

- Entered value is not the expected one. X was the expected value.
- Retry with X value or disconnect.

If unsuccessful, key A + Enter.  
If still unsuccessful, go to 20.

Modem  
WRAP  
Test  
+Enter  
(19)

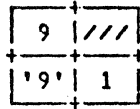
LED displays

'9'	0
-----	---

- The line between the PTT modem and the 5973-L02 is defective.
- Check that the PTT modem is ON, DSR (107), DCD (109), CTS (106) lit. If DSR, or DCD not lit contact the PTT.
- If CTS not lit, check if RTS (105)

is lit. If yes, contact the PTT,  
if not, check cable connections.  
• Retry WR/P test.

If unsuccessful, call the IBM CE.



- Check the PPT modem.  
RD (104), CTS (106) lit.  
If RD is not lit, contact the PTT.
- If CTS not lit, check if RTS (105)  
is lit. If yes, contact the PTT,  
if not, check cable connections.
- Retry WR/P test.

If unsuccessful, call the IBM CE.

Note: The correct result must be A (flashing or not) on  
the left LED, and any value on the right LED.

Note: WRAP test "9" must be performed with the modem's  
local loop position ON. In the case of a wrong manipulation,  
re-initialize the 5973-L02 by performing POWER OFF, POWER ON.

WRAP test "9" and the cluster's WRAP test are exclusive.  
They cannot run simultaneously.

(20) +

Retry the complete problem  
determination from loading (IML).  
If unsuccessful again, call  
the IBM CE if not under  
the PTT's responsibility.

11/11/11  
11/11/11  
11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11

11/11/11



LINE MODEM INTERFACE

The modem interface is under the control of the X25 adapter card. It monitors the communications line for:

- Serialization of data on the line
- Deserialization of data from the line
- Zero bit insertion/deletion
- Flag character decoding
- Block check character accumulation and insertion for transmit operations
- Block check character checking in receive operations
- Abort and idle sequence decoding
- Line status control
- Adjustable timeout.

It provides eight registers with direct access from the processor to buffer the miscellaneous statuses of the line attachment control code.

A local loop facility is provided to test the adapter. It is used in CE routines.

FRAME CONTROL SEQUENCES

Flag

The flag is the following sequence: 01111110.

Abort

The adapter interprets a binary 0 followed by a sequence of seven binary ones (01111111) as an abort and sets a bit for the processor.

Idle

The adapter recognizes an idle sequence when sixteen consecutive ones have been received from the line.

BCC (Block Check Character)

The transmitter performs a division of the binary value of the transmission to be checked, using the generator polynomial:

$$X^{16} + X^{12} + X^5 + 1$$

Integer quotient digits are ignored and the transmitter sends the complement of the resulting remainder value in the FCS field.

NETWORK INTERFACE

The IBM 5973-L02 provides an EIA Recommended Standard 232C and CCITT Recommendation V.24 type interface for attachment to the network.

The following list shows the interface lines used by the IBM 5973-L03.

Pin Number	EIA/CCIT Circuit	Line Description
2	BA/103	Transmitted data
3	BB/104	Received data
4	CA/105	Request to send
5	CB/106	Clear to send
6	CC/107	Data set ready
7	AB/102	Signal ground
8	CF/109	Received line signal detector
10	--/--	Signal ground
15	DB/114	Transmitter signal element timing
17	DD/115	Receiver signal element timing
20	CD/108.2	Data terminal ready
25	--/142	Test (can be inhibited by strapping)

## LINE DESCRIPTION

### Transmitted Data (BA/103)

This circuit transfers data from the IBM 5973-L02 to the network modem for transmission. The IBM 5973-L02 holds circuit 103 in the Mark condition when no signals are to be transmitted, or when any of the following circuits are in the OFF condition:

- Request to send (CA/105)
- Clear to send (CB/106)
- Data set ready (CC/107)
- Data terminal ready (CD/108.2).

### Received Data (BB/104)

The network modem generates signals on this circuit in response to data signals received from the network channel.

### Request to Send (CA/105)

The 5973-L02 generates signals on this circuit to condition the network modem for data transmission.

### Clear to Send (CB/106)

The network modem must send signals on this circuit to the IBM 5973-L02, indicating whether the network modem is ready to transmit data.

### Data Set Ready (CC/107)

The network modem generates signal on this circuit to indicate its status.

### Signal Ground (AB/102)

This conductor establishes the common ground reference for all interface lines.

### Receive Line Signal Detector (CF/109)

The network modem generates signals on this circuit. The ON condition of this circuit is present when the network modem is receiving a signal that meets its suitability criteria.

### Transmitter Signal Element Timing (DB/114)

Signals on this circuit are used to provide the IBM 5973-L02 with signal element timing information. The IBM 5973-L02 changes the transmitted data signals simultaneously with the OFF to ON transitions of this circuit. The transmitter's signal element timing pulses must have an accuracy of  $\pm 0.01\%$ . This timing signal must be a square wave with a  $50\% \pm 10\%$  duty cycle.

Transmitter signal element timing pulses must be continuous whenever circuit CC/107 (data set ready) is ON.

### Receiver Signal Element Timing (DD/115)

Signals on this circuit are used to provide the IBM 5973-L02 with received signal element timing information. The transition from ON to OFF must indicate the center of each signal element on circuit BB/104 (received data).

### Data Terminal Ready (CD/108.2)

The IBM 5973-L02 generates signals on this circuit. The IBM 5973-L02 presents an ON condition on this circuit at power ON, if the data set ready circuit is active and the test circuits are inactive.

The ON condition is still present even if the data set ready goes to the OFF condition.

### Test (Not used for DATAPAC)

The network modem generates signals on this circuit to indicate that a test is in progress. It is in an ON condition when there is:

- Either a TEST command on the PTT junction (automatic or manual),
- Or a MANUAL WRAP command on the network modem (see function "9").

### 5973-L02 LINE DTE INTERFACE

The DTE Interface is under the control of the SDLC adapter card. It monitors the DTE Interface for:

- Serializing data to the DTE
- Deserializing data from the DTE
- Zero bit insertion/deletion
- Flag character decoding
- Block check character accumulation and insertion for transmit operations to the DTE
- Block check character checking in receive operations from the DTE
- Abort and idle sequence decoding
- Line status control
- Adjustable timeout.

It provides eight registers with direct access by the processor for the buffering of the miscellaneous statuses of the DTE attachment control code.

A local loop facility is provided to test the adapter. It is used in CE routines.

#### FRAME CONTROL SEQUENCES

##### Flag

The flag is the following sequence: 01111110.

##### Abort

The adapter interprets a binary 0 followed by a sequence of seven binary ones (01111111) as an abort, and sets a bit for the processor.

##### Idle

The adapter recognizes an idle sequence when sixteen consecutive binary ones have been received from the DTE attachment.

##### BCC (Block Check Character)

The transmitter performs a division of the binary value of the transmission to be detected by the generator polynomial:

$$X^{16} + X^{12} + X^5 + 1.$$

Integer quotient digits are ignored and the transmitter sends the complement of the resulting remainder value in the FCS field.

#### DTE INTERFACE

The following list shows the interface lines used by the IBM 5973-L02:

Pin Number	EIA/CCIT Circuit	Line Description
2	BA/103	Transmitted data
3	BB/104	Received data
4	CA/105	Request to send
5	CB/106	Clear to send
6	CC/107	Data set ready
7	AB/102	Signal ground
8	CF/109	Received line signal detector
15	DB/114	Transmitter signal element timing
17	DD/115	Receiver signal element timing
18	CX/--	Wrap (can be inhibited by strapping)
20	CD/108.2	Data terminal ready

#### LINE DESCRIPTION

##### Transmitted Data (BA/103)

This circuit transfers data from the DTE (Data Terminal Equipment) to the IBM 5973-L02. The DTE holds circuit 103 in the mark condition when no signals are to be transmitted, or when any of the following circuits are in the OFF condition:

- Request to send CA/105



- Clear to send (CB/106)
- Data terminal ready (CD/108.2).

#### Received Data (BB/104)

The 5973-L02 generates signals on this circuit in response to data signals received from the network modem.

#### Request to Send (CA/105)

The DTE generates signals on this circuit to condition the 5973-L02 for data transmission.

#### Clear to Send (CB/106)

The IBM 5973-L02 must generate signals on this circuit to the DTE, indicating whether it is ready to accept data. The ON condition is present when the 5973-L02 detects an ON condition on circuit 105, if the virtual circuit has been established with the PTT network.

#### Data Set Ready (CC/107)

To indicate its status, the 5973-L02 generates signals on this circuit. It is in the ON condition after successful initialization and when the network modem is ready.

#### Signal Ground (AB/102)

This conductor establishes the common ground reference for all interface lines.

#### Receive Line Signal Detector (CF/109)

The 5973-L02 generates signals on this circuit. The ON condition is present when the 5973-L02 detects an OFF condition in request to send (CA/105) on the cluster side.

#### Transmitter Signal Element Timing (DB/114)

Signals on this circuit provide the DTE with signal element timing information. The DTE changes the transmitted data signals simultaneously with OFF to ON transitions on this circuit. The transmitter signal element timing pulses must have an accuracy of  $\pm 0.01\%$ . This timing signal is a continuous square wave with  $50\% \pm 10\%$  duty cycle. Transmitter signal element timing pulses are continuous whenever circuit CC/107 (data set ready) is ON.

#### Receiver Signal Element Timing (DD/115)

Signals on this circuit are used to provide the DTE with received signal element timing information. The transition from ON to OFF indicates the center of each signal element on circuit BB/104 (received data).

#### Wrap (CX)

The DTE provides signals on this circuit.

An active level sets the IBM 5973-L02 to local test. The IBM 5973-L02 answers by setting signals on circuits 106/107/109 after receiving a signal on circuit 105. Timings are continuously provided on circuits 114/115.

Data Terminal Ready (CD/108.2)

The DTE generates signals on this circuit to allow the IBM 5973-L02 to establish the virtual circuit with the PTT network (LAP and PLP level). With the PN 8684649 cassette (this number is written on the cassette itself), the display will be A1 when the DTR is inoperative or fails.

5973-L02 PHYSICAL PLANNING

1. Dimensions

	width	depth	height
in centimeters	32.5	41	24.5

2. Service Clearances:

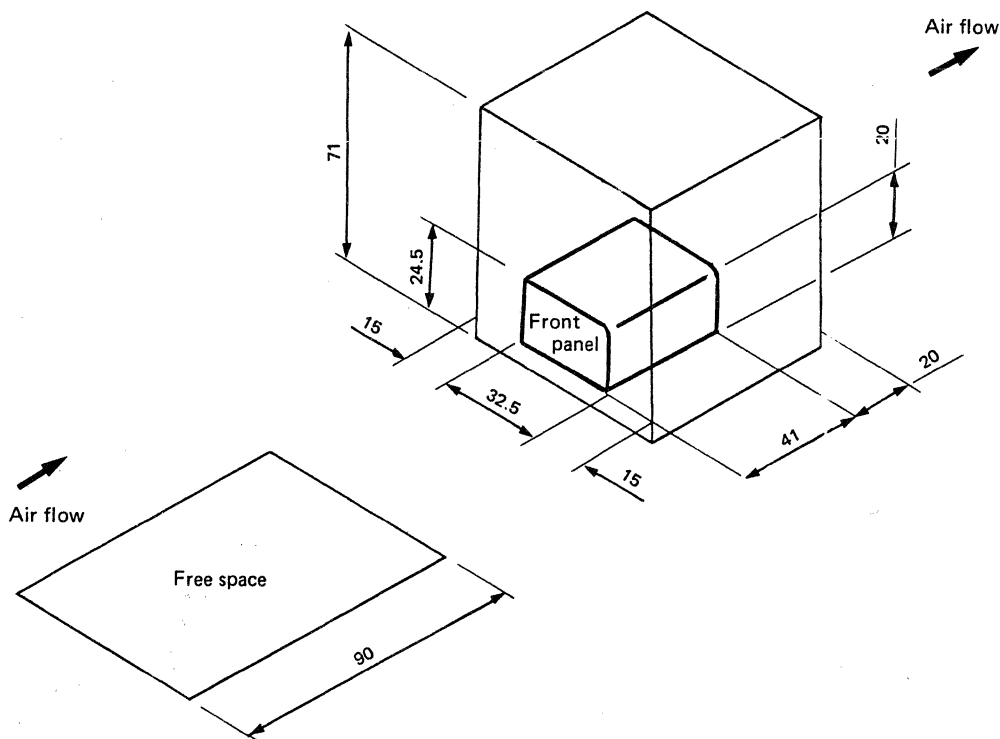


Figure 5. IBM 5973-L02 Measurements and Service Clearances

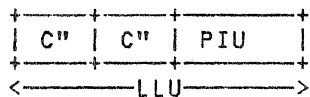
3. Weight: 11 kilograms.
4. Heat Output:
  - BTU/hour 320
  - Kcal/hour 80
5. Air flow: 1.7 m<sup>3</sup> / mn (60 Ft<sup>3</sup> / mn)
6. Environmental Requirements
  - a. Temperature:
    - 10 to 40.6 Celsius (50 to 105 F)
  - b. Relative Humidity:
    - 8 to 80%
  - c. Maximum Wet Bulb:
    - 26.7 Celsius (80 F)
7. Power Requirements
  - a. 100, 110, 112.5, 115, 123.5 or  
200, 208, 220, 230, 235 volts a.c.
  - b. Voltage Tolerance: ± 10%
  - c. Phase: Single.
  - d. Frequency range: 49 to 61 Herzs.
  - e. Power Consumption: 200 VA at the rated voltages.

## 5973-L02 LOGICAL LINK CONTROL DESCRIPTION

The LLC is the lowest end-to-end user procedure.

### THE LLC PROCEDURE

The LLC assumes the exchange of Logical Link Units (LLUs) between the host and the cluster. It provides for both virtual circuit status control, and control of the information transfer's integrity, using N(S). Error recoveries are not performed. This means that in the case of a level 2 LLC, should a incorrect N(S) occur, the virtual circuit is reset. For a permanent virtual circuit, a CLEAR packet is initialized.



The C field (two bytes) corresponds to the C" field shown.

It is a full duplex point-to-point procedure working in asynchronous response mode. It operates with primary/secondary relationships.

Primary = 3705-II with X25NPSI or NIA-F

Secondary = 5973-L02 (NIA-R)

This LLC uses the two-byte Physical Services Header (PSH) as C"s, to convey in an X25 packet the CONTACT and DISCONTACT responses of the cluster, received by the SDLC layer of the NIA-R after translation in accordance with the following table:

<u>SDLC</u>		<u>LLC/PSH</u>	
XID	————>	PSXID	————>
XID	<————	PSXID	<————
SNRM	————>	PSCONTACT	————>
UA (NSA)	<————	PSCONTACT	<————
DISC	————>	PSDISC	————>
UA (NSA)	<————	PSDISC	<————
SNRM	————>	PSCONTACT	————>
DM (ROL)	<————	PSDISC	<————
TEST	————>	PSTEST	————>
TEST	<————	PSTEST	<————
RQD	<————	PSDISC	<————
DISC	————>	PSDISC	————>
UA (NSA)	<————		

An end-to-end sequence control is also performed by using a single module 256 sequence number in the PSH used to convey a PIU or part of a PIU in an X25 packet.

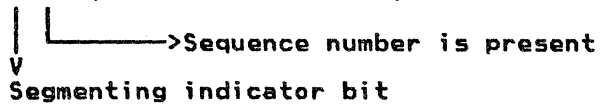
If the PIU is too large to be sent in a single packet, the PSH segmenting indicator is used.

Note that the PSH segmenting indicator is used for information only. This means that the length of data in both the XID (answer) and TEST (both ways) must be limited to the packet length used by the PPSN minus two bytes (PSH). For example, with a packet length of 128, the length of data for the XID answer is limited to 126 bytes.

**PSH FORMAT**

The PSH is always composed of two bytes in the NIA:

PSH TYPE FID-FOX LLC	BYTE 1								BYTE 2								DATA FOLLOWS ?
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	
PSDISC	1	1	1	1	0	0	0	1	0	0	0	0	0	0	1	0	NO
PSXID	1	1	1	1	0	0	0	1	0	0	0	0	0	1	0	0	YES if answer (limited)
PSTEST	1	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	YES both ways (limited)
PSCONTACT	1	1	1	1	0	0	0	1	0	0	0	0	1	0	0	0	NO
LAST OR ONLY SEGMENT INFO	1	1	1	1	0	0	1	0	←—————→ Seg. Numb.								YES
1st OR MID SEGMENT INFO	1	1	1	1	0	1	1	0	←—————→ Seg. Numb.								YES



**Note 1:** PSFRMR (coded X'0A') is not used by the NIA. This case is reported at PLP level in a CLEAR or RESET command.

**Note 2:** The SDLC cluster address is carried behind the two LLC bytes, in PSTEST and PSCONTACT, going from the remote NIA to the host side.

**SEGMENTING A PIU**

The PIU received from the host/CA can contain up to 269 characters (the RU being limited to 256 bytes in NIA-F).

Because the subscription on the X25 network may use packet lengths inferior to 269 bytes, The NIA-F must separate the data into several packets.

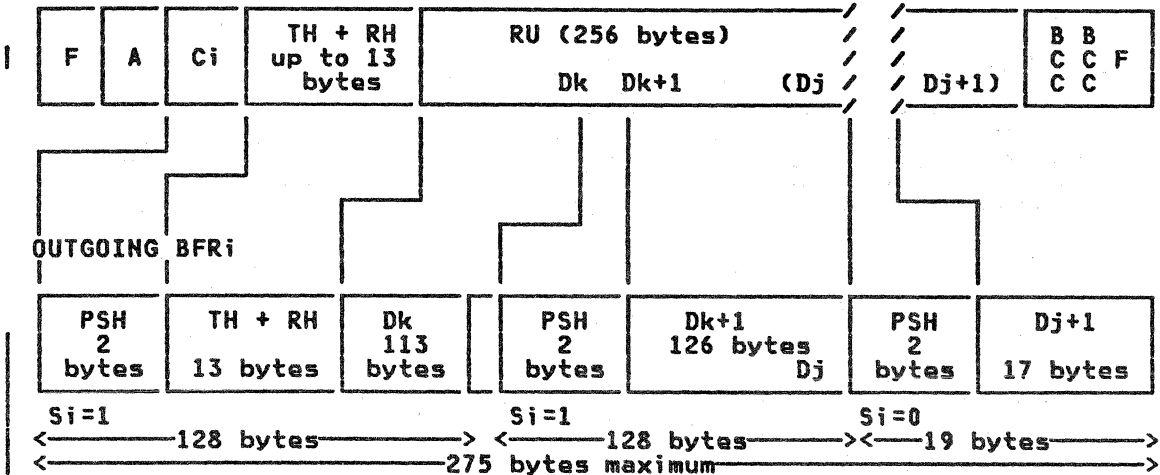
This operation known as segmenting, is executed directly in the outgoing buffer when the characters are received from the SDLC line. The BNF layer updates a counter when each character is received and, when the count is equal to the length of an X25 packet, a new 2-byte PSH is incorporated to the buffer before the next received character is stored.

If this next character does not exist, it means that the received PIU had the correct length to be sent through the network. The PSH that was created is then overwritten when the next PIU is received.

If this character does exist, segmenting occurs and the BNF layer returns to the PSH label of the created segment to incorporate the SI (segmenting indicator) bit in bit 5 of the first byte. The BNF layer ensures that the pointers are in the correct positions to permit the overwriting of the created X25 packets, should the frame be incorrect at the end of the received PIU.

Segmenting Example (With TH Format FID1)

RU = 256  
 Packet length = 128  
 TH + RH = 13



**DESEGMENTING PACKETS TO RECOMBINE A PIU**

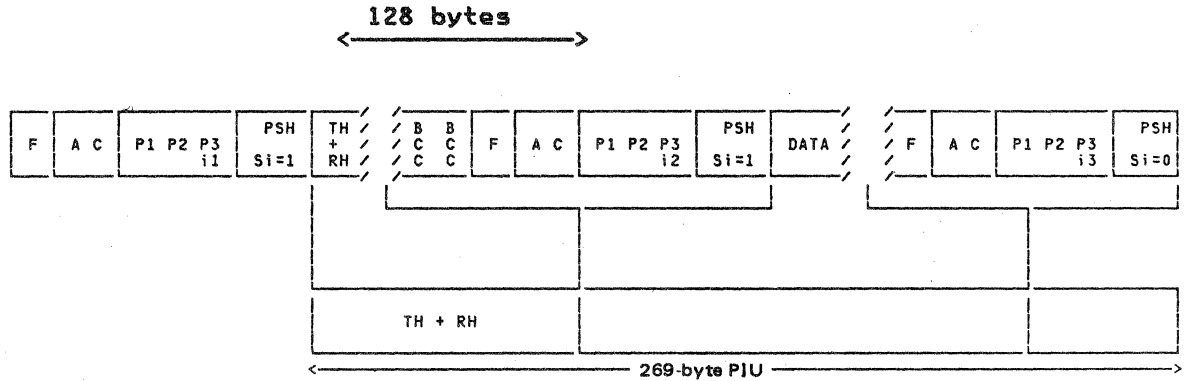
The packets received from the X25 line contain a 2-byte PSH at the beginning of the data string. If bit 5 of the first byte of the PSH is set to 1, the received packet contains only a part of the PIU sent by the remote cluster.

The BNF layer recombines the PIU in the incoming buffer directly, by keeping the first string of data in the buffer (no update of the XMIT pointer) and by eliminating the 2-byte PSH and before storing the characters of the next packet. When no more data is needed to make up the PIU (bit 5 of the first byte of the PSH set to 0 in a received packet), the BNF updates the XMIT pointer to allow transmitting the completed PIU to the host/CA.

The BNF layer performs the necessary recoveries is there is an incorrect frame in an X25 frame conveying the packets, to allow overwriting correctly the erroneous data in the buffer.

Example of Desegmenting

RU = 256  
 TH + RH = 13  
 Packet length = 128



Note: These functions are performed on the cluster side by NIA-R in the same manner as is done on the host side by NIA-F.

#### HOW THE SDLC IS CONTROLLED BY THE LLC

When the LLC receives PS CONTACT command, it orders the SDLC to issue the SNRM command to the cluster. When it receives the NSA response, the SDLC transmits it to the LLC and puts the 5973-L02 in the F displayed status.

The SDLC conditions its polling by means of this F status.

The LLC data received when the 5973-L02 is not in the F status is discarded. It is not transmitted to the cluster. When the SDLC receives a DM response, it sends an SNRM only if the 5973-L02 is in the F status. If the 5973-L02 is not in the F status, the SDLC ignores the DM response.

When the LLC receives a PSDISC command, it orders the SDLC to send DISC to the cluster. When the UA response is received, the SDLC transmits it to the LLC and puts the 5973-L02 in the F displayed status. Then, the polling operation is stopped.

#### SDLC REPORT TO THE PLP

When the SDLC sends a command without obtaining a response, it enters a timeout recovery procedure and re-issues the command that was not answered five times with about a 4-second interval between each retransmission. If there is still no answer after the fifth retransmission of the command, the SDLC orders the PLP to send a RESET or a CLEAR REQUEST to the network (switched or permanent VC).

GA11-8643-2

IBM 5973-L02 Remote NIA SC 7043 PDM Printed in Denmark GA11-8643-2



IBM World Trade Americas/Far East Corporation  
Town of Mount Pleasant, Route 9, North Tarrytown, N.Y., U.S.A. 10591

IBM Eurocoordination  
Tour Franklin, Cedex 11, 92081 Paris la Défense, France



IBM 5973-L02 Remote NIA SC 7043  
Product Description Manual  
GA11-8643-2

READER'S  
COMMENT  
FORM

This manual is part of a library that serves as a reference source for systems analysts, programmers, and operators of IBM systems. This form may be used to communicate your views about this publication. It will be sent to the author's department for whatever review and action, if any, is deemed appropriate. Comments may be written in your own language: use of English is not required.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

*Note: Copies of IBM publications are not stocked at the location to which this form is addressed. Please direct any requests for copies of publications, or for assistance in using your IBM system, to your IBM representative or to the IBM branch office serving your locality.*

Possible topics for comments are:

Clarity    Accuracy    Completeness    Organization    Coding    Retrieval    Legibility

If you want a reply, please give your name and mailing address:

-----  
-----  
-----  
-----

Note: Staples can cause problems with automated mail sorting equipment.  
Please use pressure sensitive or other gummed tape to seal this form.

What is your occupation? -----

Number of latest Newsletter associated with this publication: -----

Thank you for your cooperation. See other side for mailing instructions.

**Reader's Comment Form**

Please hand this form to an IBM office or representative, or mail directly to the address shown below.

Fold and Tape

Please Do Not Staple

Fold and Tape

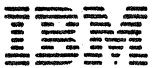
Affix  
Stamp

Compagnie IBM France  
Centre d'Etudes et de Recherches  
Special Engineering  
Service 0959  
06610 La Gaude  
France

Fold and Tape

Please Do Not Staple

Fold and Tape



IBM World Trade Americas/Far East Corporation  
Town of Mount Pleasant, Route 9, North Tarrytown, N.Y., U.S.A. 10591

IBM Eurocoordination  
Tour Franklin, Cedex 11, 92081 Paris la Défense, France

RT-TRYKSYSTEM ApS

IBM 5973-LO2 Remote NIA SC 7043 PDM Printed in Denmark GA11-8643-2

Cut or Fold Along Line

Cut or Fold Along Line

This Newsletter No. GN19-6760  
Date 6 July 1982  
Base Publication No. GA11-8643-2  
File No. S370/4300-09  
Previous Newsletters None

**IBM 5973-L02 Remote Network Interface Adapter  
Specify Code 7043  
Product Description Manual**

© Copyright IBM Corp. 1982

This Technical Newsletter provides replacement pages for the subject publication. The replacement pages are only valid to customers using the PN2 microcode (July 82 EC). Regular (PN1 - current EC) customers should continue to use the dash 2 level of the current base publication.

These replacement pages remain in effect for any subsequent releases/levels, unless specifically altered. Pages to be inserted and/or removed are:

i, ii  
1, 2  
2.1 (added)  
9-14  
17, 18  
18.1 (added)  
23, 24

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

**Summary of Amendments**

Technical changes to the text.

*Note: Please file this cover letter at the back of the manual to provide a record of changes.*

# IBM Technical Newsletter

This Newsletter No. GN11-8577  
Date 20 April 1983  
Base Publication No. GA11-8643-2  
File No. S370/4300-09  
Previous Newsletters GN19-6760

## IBM 5973-L02 Remote Network Interface Adapter Specify Code 7043 Product Description Manual

© Copyright IBM Corp. 1980, 1981, 1982

This Technical Newsletter provides replacement pages for the subject publication.

These replacement pages remain in effect for any subsequent releases/levels, unless specifically altered.

Pages to be inserted and/or removed are:

i, ii  
2.1  
3, 4  
27-Back Cover

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

### Summary of Amendments

Technical changes to the text.

*Note: Please file this cover letter at the back of the manual to provide a record of changes.*